

### Frontier of Environment-Friendly Materials ! Full Lineup of Flame Retardant-free Compounds

#### Strong Points

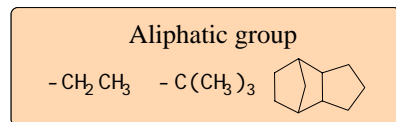
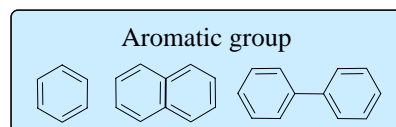
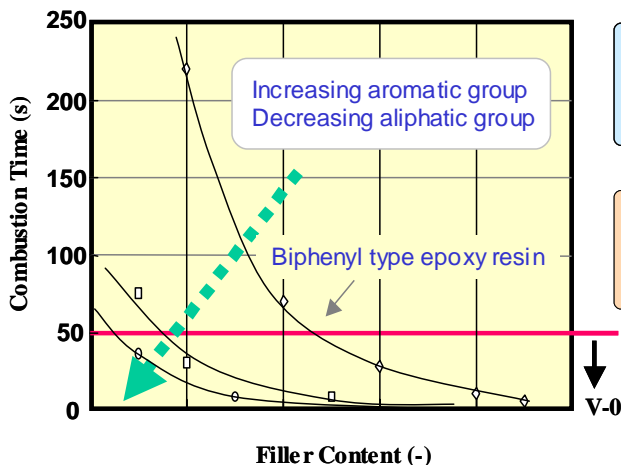
- a) Line Up for Several Lead Frame Types. (Cu,42Alloy,Pd/Au plated)
- b) All of Lineup w/ No Flame Retardant Compounds are Highly Reliable.
- c) KE-G3000 Series and KE-G280 Series Possess Top Ranked Reliability Especially in Reflow Resistance under Pb Free Condition.

#### Application

·TSOP ·SOP ·Larger QFP ·Smaller QFP ·DIP

#### General Properties

| Item             | Units  | KE-G280K              | KE-G3000D   | KE-G3000DA  | KE-G3000F | KE-G3400 |     |
|------------------|--------|-----------------------|-------------|-------------|-----------|----------|-----|
| Spiral flow      | cm     | 100                   | 110         | 100         | 100       | 105      |     |
| Gel time         | s      | 22                    | 26          | 22          | 25        | 23       |     |
| Tg               | °C     | 125                   | 118         | 120         | 120       | 125      |     |
| C.T.E            | α1     | x10 <sup>-5</sup> /°C | 1.0         | 1.0         | 0.8       | 0.8      | 0.7 |
|                  | α2     |                       | 3.8         | 3.8         | 3.4       | 3.4      | 2.5 |
| Flexural modulus | 20 °C  | GPa                   | 23          | 22          | 24        | 24       | 26  |
|                  | 240 °C |                       | 0.9         | 0.5         | 0.7       | 0.7      | 1.3 |
| Application      |        | Cu                    | Cu<br>Pd/Au | Cu<br>Pd/Au | 42        | 42       |     |



**Flame Retardant Characteristics achieve by**  
**Increasing Aromatic Groups and Decreasing Aliphatic Groups**

#### Reflow Resistance

QFP80 leads (Cu) : 14mm x 14mm body, 1.6mm; 6mm x 6mm chip  
 Pre-condition: 85°C / 60%RH 168h + IR (260 °C max. 4 times)

| Item          | KE-G280K | KE-G3000D | KE-G3000DA |
|---------------|----------|-----------|------------|
| Delamination* | 0/30     | 0/30      | 0/30       |
| Package Crack | 0/30     | 0/30      | 0/30       |

QFP208 leads (Pd/Au) : 28mmx28mm body, 3.6mm; 9mmx9mm chip  
 Pre-condition: 30°C / 70%RH 192h + IR (260 °C max. 4 times)

| Item          | KE-G3000D | KE-G3000DA |
|---------------|-----------|------------|
| Delamination* | 0/30      | 0/30       |
| Package Crack | 0/30      | 0/30       |

\*:no less than 50%

TSOP 50 leads (42Alloy) : 400mils, 1.0mm; 7mm x 15mm chip  
 Pre-condition: 85°C / 85%RH 168h + IR (260°C max. 4 times)

| Item          | KE-G3000F | KE-G3400 |
|---------------|-----------|----------|
| Delamination* | 0/30      | 0/30     |
| Package Crack | 0/30      | 0/30     |